

Application No.: 09/917,700

Docket No.: 21994-00026-US

AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions, listing of the claims.

Listing of the Claims:

1. Cancelled
2. Cancelled
3. (Currently Amended) The recording and reproducing apparatus as claimed in claim 2 9, wherein the decoding means comprises a waveform equalizing circuit for obtaining a desirable partial response characteristic from the tangential push-pull reproduced signal.
4. (Currently Amended) The recording and reproducing apparatus as claimed in claim 2 9, wherein the decoding means is a viterbi decoder.

Application No.: 09/917,700

Docket No.: 21994-00026-US

5. (Original) The recording and reproducing apparatus as claimed in claim 3, wherein a partial response polynomial equation for equalizing a reproduced signal in the partial response characteristic is $1+D-D^2-D^3$.

6. (Original) The recording and reproducing apparatus as claimed in claim 3, wherein the decoding means is a viterbi decoder.

7. (Original) The recording and reproducing apparatus as claimed in claim 4, wherein a partial response polynomial equation for equalizing a reproduced signal in the partial response characteristic is $1+D-D^2-D^3$.

8. Cancelled

9. (New) A recording and reproducing apparatus for an optical information recording medium comprising a pit recording area recorded with various control information by a prepit, and a user recording area having a guide groove forming a groove format track, the depth of the prepit and the groove being approximately the same and less than or equal to $\lambda/10$, where λ is the wavelength of a light source for reproducing information from the optical information medium;

the recording and reproducing apparatus comprising:

Application No.: 09/917,700

Docket No.: 21994-00026-US

detecting means including a light detector having four areas defined as first to fourth areas in a first direction of a tangential line of the track, and in a second direction orthogonal to the tangential line, wherein a first pair of a first area and a second area and a second pair of a third area and a fourth area are both aligned in the first direction;

wherein a third pair of the first area and the fourth area and a fourth pair of the second area and the third area are both aligned in the second direction, for detecting information from the pit recording area by detecting a signal in a form of a tangential push-pull reproduced signal;

further wherein the tangential push-pull reproduced signal is detected by a difference of a first signal adding the signal reproduced from the third pair of the first area and the fourth area and a second signal adding the signal reproduced from the fourth pair of the second area and the third area, and for detecting user information reproduced from the user recording area by detecting a signal as an aggregated signal;

wherein the aggregated signal is detected by adding the signal reproduced from a first area to fourth area; and

decoding means for decoding information from the tangential push-pull reproduced signal and the aggregated signal.

Application No.: 09/917,700

Docket No.: 21994-00026-US

10. (New) A reproducing apparatus for an optical information recording medium comprising a pit recording area recorded with various control information by a prepit, and a user recording area having a guide groove forming a groove format track, the depth of the prepit and the groove being approximately the same and less than or equal to $\lambda/10$, where λ is the wavelength of a light source for reproducing information from the optical information medium;

the reproducing apparatus comprising:

detecting means including a light detector having four areas defined as first to fourth area areas in a first direction of a tangential line of the track, and in a second direction orthogonal to the tangential line, wherein a first pair of a first area and a second area and a second pair of a third area and a fourth area are both aligned in the first direction;

wherein a third pair of the first area and the fourth area and a fourth pair of the second area and the third area are both aligned in the second direction, for detecting information from the pit recording area by detecting a signal in a form of a tangential push-pull reproduced signal;

further wherein the tangential push-pull reproduced signal is detected by a difference of a first signal adding the signal reproduced from the third pair of the first area and the fourth area and a second signal adding the signal reproduced from the fourth pair of the second area and the third area, and for detecting user information reproduced from the user recording area by detecting a signal as an aggregated signal;

Application No.: 09/917,700

Docket No.: 21994-00026-US

wherein the aggregated signal is detected by adding the signal reproduced from a first area to fourth area; and

decoding means for decoding information from the tangential push-pull reproduced signal and the aggregated signal.